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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/733,277	12/12/2003	Hong-Da Liu	MR2707-52	8233
4586	7590	12/12/2005	EXAMINER	
ROSENBERG, KLEIN & LEE 3458 ELLICOTT CENTER DRIVE-SUITE 101 ELLICOTT CITY, MD 21043			SCHECHTER, ANDREW M	
			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 12/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/733,277

Applicant(s)

LIU, HONG-DA

Examiner

Andrew Schechter

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15, 17 and 18 is/are pending in the application.
- 4a) Of the above claim(s) 2, 6 and 8-15 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 17 and 18 is/are allowed.
- 6) ☒ Claim(s) 1 and 3-5 is/are rejected.
- 7) ☒ Claim(s) 7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Objections

2. Claim 18 is objected to because of the following informalities: claim 18 should depend from claim 17 rather than (the cancelled) claim 16. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 and 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Hirakata et al.*, U.S. Patent No. 6,839,108 in view of *Yamazaki et al.*, U.S. Patent No. 6,242,343 in view of *Nakamura et al.*, U.S. Patent No. 6,124,911.

Hirakata discloses [see Fig. 17, for instance] a pixel structure for an LCOS display to reflect an incident light at an incident angle to an output light at an output angle, the pixel structure comprising an electrode [1913], an insulator [1915] formed on

the electrode, a plurality of reflectors [1922] on the insulator for reflecting the first light to a second light at a second angle to be further refracted by the glass plate to the output light, a passivation [1918] on the plurality of reflectors and the insulator, and a transparent conductor [1916] on the passivation.

Hirakata shows (parts of) three reflectors in the figure. The term “pixel” is slightly ambiguous in the art: here the examiner interprets a pixel not as the area corresponding to a single pixel electrode, but as the area corresponding to three such pixel electrodes (with red, green, and blue sub-pixels), making up one picture element, or pixel. Thus, a single “pixel structure” will have three pixel electrodes and three reflectors (a plurality).

Hirakata refers to the substrate 1901 as a “glass substrate” rather than a silicon substrate [col. 26, lines 44-50] (this is relevant because of the limitation that it is an LCOS display – liquid crystal on silicon). This appears to be an error, as the drawing itself and the related description is appropriate to circuitry embedded in a silicon wafer, rather than formed on top of a glass sheet. *Yamazaki* discloses analogous devices and figures where the substrate shown in Fig. 17 of *Hirakata* is made from a silicon wafer [401, compare Fig. 4 and Fig. 1]. It would have been obvious to one of ordinary skill in the art at the time of the invention to use such a silicon wafer in making the device of *Hirakata*’s Fig. 17, motivated by the desire to form high quality embedded transistor elements in the silicon substrate as shown.

Hirakata does not disclose in this embodiment a glass plate for refracting the incident light to a first light at a first angle, which is over the electrode. *Nakamura* discloses an analogous display device in which a glass plate [19] is placed above the

silicon substrate with its electrodes and reflectors. It would have been obvious to one of ordinary skill in the art at the time of the invention to use such a glass plate above the substrate shown in Fig. 17 of *Hirakata*, motivated by the desire to provide an inexpensive substrate to sandwich in the liquid crystal and attach counter electrodes to.

Claim 1 is therefore unpatentable.

The transparent conductor is directly connected to the electrode, as shown in Fig. 17, so claim 3 is also unpatentable.

Hirakata does not disclose that each of the plurality of reflectors is oblique at a third angle (they are horizontal). *Nakamura* does disclose an analogous device in which the reflectors are disposed obliquely at a third angle [see Figs. 5-7, for instance]. It would have been obvious to one of ordinary skill in the art at the time of the invention to incline the reflectors in this way, motivated by *Nakamura's* teaching that this improves the efficiency of the use of the light which is displayed [col. 10, lines 11-29]. Claim 4 is therefore unpatentable.

Hirakata discloses [see Figs. 9 or 14] in a different (but very similar) embodiment, that the reflectors can comprise a highly reflective metal, such as aluminum [col. 9, lines 18-23]. It would have been obvious to one of ordinary skill in the art at the time of the invention to do so, motivated by the desire to form a highly reflective reflector in a single deposition process. Claim 5 is therefore unpatentable.

Alternatively, Figs. 9 or 14 of *Hirakata* could be taken as the primary reference rather than Fig. 17; the only claim element shown in Fig. 17 and not in Figs. 9 and 14 is the presence of a silicon substrate; it would have been obvious to one of ordinary skill in

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the art at the time of the invention to use such a silicon substrate as shown and taught by *Yamazaki*, as discussed above, motivated by the desire to form high quality embedded transistor elements in the silicon substrate. The remaining claim limitations are disclosed or taught by *Hirakata* and *Nakamura* as discussed above, so claims 1 and 3-5 unpatentable.

Allowable Subject Matter

5. Claim 7 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. Claims 17 and 18 are allowed.

7. The following is a statement of reasons for the indication of allowable subject matter:

The prior art does not disclose the device of claim 7, in particular the additional limitation that the plurality of oblique reflectors comprises 1st-3rd groups at 3rd-5th angles for reflecting 1st-3rd wavelengths of light, respectively. Claim 7 would therefore be allowable if rewritten appropriately.

Similarly, the prior art does not disclose the device of claim 17, in particular the limitation that the 1st-3rd wavelengths of light are respectively reflected by 1st-3rd groups of reflectors having reflective surfaces oblique at 3rd-5th angles, respectively. Claim 17 is therefore allowed, as is its dependent claim 18. (Note, however, the above objection to claim 18.)

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

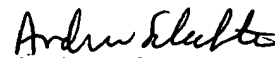
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Schechter whose telephone number is (571) 272-2302. The examiner can normally be reached on Monday - Friday, 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Andrew Schechter
Primary Examiner
Technology Center 2800
2 December 2005